

### ABSTRACT OF THE DISCLOSURE

A mass spectrometer includes an ion source, an extraction device, a TOF mass analyzer, an ion trap mass analyzer, and an ion guiding optical element which guides at least one of extracted ions from the ion source and extracted ion fragments into the TOF mass analyzer in a normal mode of operation and into the IT mass analyzer in a tandem mode of operation. The apparatus operates by producing ions from a sample, extracting the ions from the ion source, selecting between the TOF mass analyzer and the IT mass analyzer, directing extracted ions to the selected mass analyzer, mass-separating the directed ions and fragments of the directed ions according to a mass-to-charge ratio, detecting mass-separated ions with the selected mass analyzer, and producing at least one of a normal mass spectrum and a tandem mass spectrum.